NOAA Atlas 14: The new precipitation frequency atlas for California

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NOAA Atlas 14 Volumes

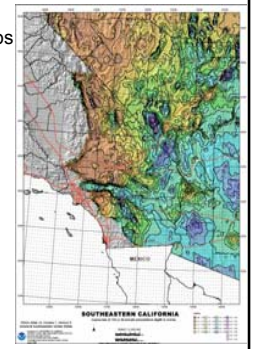
- Volume 1: Semiarid southwestern U.S.
- Volume 2: Ohio River basin and surrounding states
- Volume 3: Puerto Rico and U.S. Virgin Islands
- Volume 4: Hawaiian Islands (in progress)
- Planned: Remainder of State of California

Precipitation Frequency Estimates

- Durations: 5-min to 60-day
- Average Recurrence Intervals: 1-year to 1,000-year
- Annual Maximum and Partial Duration Results
- High Resolution Spatial Estimates (30 arc second)
- Confidence Limits (upper and lower 90%)

Products & Delivery

- Web-Based Delivery
  Precipitation Frequency Data Server:
  www.nws.noaa.gov/ohd/hdsc
- High Quality Cartographic Maps
- Base Grids
  - *30 arc-sec resolution*
  - *Shapefiles*
  - *Lines, vectors*
  - *SDTS format*
  - *ASCII Grids*
  - *ArcInfo compatible*
- Seasonality
- Temporal distributions
- Areal Reduction Factors
- Documentation



Methodology

Statistical Approach

Hosking and Wallis "Regional Frequency Analysis, An Approach Based on L-Moments" (1997)

- L-moments: More robust estimation
  - *choosing distribution function/shape*
  - *less sensitive to outliers*
- Regional Approach
  - *common distribution shape per region*
  - *but estimates are at site*
  - *reduces uncertainty*
- Uncertainty estimates possible
- Many added adjustments and tests

Spatial Interpolation

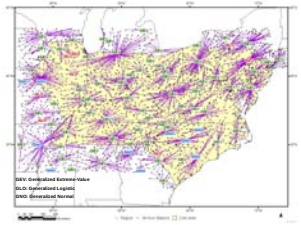
- Statistical estimates are at points
- Account for high resolution spatial variation
  - *terrain, local climate*
- PRISM technology
  - *spatial grids of distribution means for each duration*
  - *Oregon State University's PRISM Group*
  - *hybrid statistical-geographic climate mapping*
- Cascade Residual Add-Back (CRAB)
  - *hi-res spatial gridded estimates for each duration/frequency*
  - *smooth discontinuities between regions*
  - *ensures consistency between grids*

Improvements over older estimates

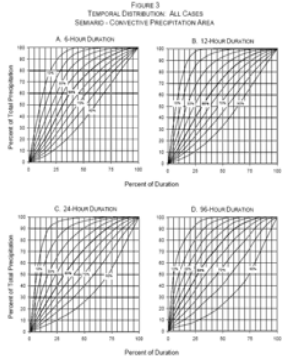
- More recent and extended data sets
- Currently accepted statistical approaches
- Improved spatial interpolation and mapping techniques

Example of heterogeneity measures for regional groups of daily stations in Volume 1.

Example of distribution selection for regional groups of daily stations in Volume 2.



Probabilistic Temporal Distributions



"Huff Curves" show percent of total precipitation against percent of total duration for different cumulative percentiles of observed cases

Quality Control

- *QCseries* – a spatially-based tool
- Station discordancy measures
- Regional heterogeneity measures
- Practical quantile adjustments
  - *internal consistency*
  - *co-located station consistency*
  - *hourly-only station consistency*

Web-Based Output From Precipitation Frequency Data Server